Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Ohio** Print Date: **3/9/2000**

Site Summary Level: **Fernald Environmental Management Project** HQ ID: **0525**

Project **OH-FN-04 / Aquifer Restoration**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

The Aquifer Restoration and Wastewater Treatment Project consists of several elements related to the Record of Decision for remedial Actions at OU5. The primary objective of this project is to remediate the affected areas of the Great Miami Aquifer and the treatment of all site waste water.

Definition of Scope: The Aquifer Project includes Project Support and Integration, Analytical Lab Services, Aquifer Restoration Project, Environmental Monitoring, and Sample and Data Management. The Operable Unit 5 (OU5) workscope includes the completion of the remedy decision process and the implementation of remedial actions to address contaminated groundwater, soil, surface water, and sediments at the FEMP. (Note soil and sediment are in a separate project baseline.) The scope of the OU5 remedy includes sitewide responsibility for the management of stormwater, wastewater (including the operation of existing sanitary sewage treatment system), and groundwater monitoring. The volumes of affected media are based upon the cleanup levels finalized in the OU5 ROD.

Project Support & Integration (PS&I) is responsible for coordinating the application of the Functional Areas across and between the Projects applying a graded approach consistent with the overall FEMP mission and stakeholder interests. PS&I functional responsibility is integration of the above Functional Areas as support functions/services within and across Projects.

Analytical Lab Services (ALS) is responsible for all Fernald Laboratory operations. ALS includes the infrastructural administration activities for the preparation and analysis of environmental samples and programs and management of quality control for all sampling services and activities at the on-site laboratories.

Environmental Monitoring (EM) includes sampling surface water, sediment, air and biota to provide data in support of the remediation of the FEMP site as prescribed in the Records of Decision for Operable Units 1-5 and as identified in the IEMP. EM also includes administration of a comprehensive well maintenance and abandonment program that includes the evaluation of decommissioning of monitoring wells as excavation and construction activities proceed during remediation. EM is responsible for the preparation of the IEMP reports, revisions, and updates which include a comprehensive presentation of environmental surveillance and effluent monitoring data for all environmental media. EM also includes the management and control of the soil sample archive and conducting environmental as described in the IEMP.

Sample and Data Management (S&DM) supports the required scope for sample management , analytical contracting, remediation data quality assurance, and remediation data management in support of site remdiation efforts. S&DM covers the development of contracts for offsite laboratories, the receipt, packaging, and shipping of samples to offsite laboratories, the distribution of samples to the onsite laboratory, management of activities necessary to verify and assure compliance data generation functions, and the development and maintenance of data management systems for remediation data generated by the site.

Technical Approach: Groundwater recovery wells have been and will be installed to address the uranium plume. The recovered groundwater will be treated to remove the uranium prior to discharge to the Great Miami River (this action implements the recommendations of the Citizen`s Task Force (CTF) for protection of the aquifer) or for reinjection. The uranium will be recovered from the ion exchange media, packaged and shipped to the

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Project Description Narratives

Nevada Test Site (NTS).

Emerging Technologies: The DOE-OST is funding a demonstration at the FEMP to show that injection of treated groundwater can reduce the aquifer restoration time. The impact of this demonstration, sponsored by the Subsurface Contaminants Focus Area, when shown successful as predicted by groundwater models, will be to move the aquifer restoration into an accelerated time frame which will help accelerate the restoration of the entire FEMP (approximately 60%). This activity is in response to OH-F001, Enhanced groundwater pump and treat process system. The enhanced system will accelerate compliance from 27 years to approximately ten years.

Technology Needs: There are two additional technology needs that are related to monitoring activities performed under this PBS. There is a need for an "Improved High Volume Air Sampler Capable of Fracturation of Airborne Particles" (OH-F034). This need relates to splitting the data into different particle size ranges for a more realistic calculation of dose exposure to workers. This need is being addressed by the DOE Environmental Monitoring. Another need for an "Enhanced Sensitivity Radon Monitor" has not yet been addressed.

Project Status in FY 2006:

Continue operations of Advanced Wastewater Treatment Facility.

Post-2006 Project Scope:

Post-2006 activities include maintenance and standby of the Advanced Waste Water Treatment Facility (AWWT) to ensure full containment and capture of any residual contaminated groundwater plumes, monitoring and maintenance activities, D&D of the AWWT and related on-site and off-site pipelines and wells and related soils, and either shipment of this material off site or disposal in Cell 8 of the OSDF.

Project End State

Access to the OSDF will remain restricted and monitored and under institutional controls in perpetuity. The remainder of the site is expected to achieve final cleanup levels which could support various land uses. However, the decision to limit use to ecological restoration and recreational use was made based on DOE's Natural Resource Damages Act obligations and stakeholder input. Residential and agricultural uses will not be considered for any portion of the site consistent with the recommendations of the Fernald Citizens Advisory Board. Industrial uses may be considered for the 23 acres of potential economic development land. DOE, or a successor agency, will maintain stewardship responsibility for the site.

Cost Baseline Comments:

Assumptions are that pump and treat and other costs for FY 2008 and beyond are not included; the present level of RCRA, CERCLA, and NEPA integration will be maintained; potential incremental funding for construction contracts on a case-by-case basis; no contingency; and priorities for the Aquifer Restoration Project remain the same. Estimates to support the baseline for this PBS were completed using a bottoms-up approach.

The Ohio Field Office has an aggressive cost savings program in place to contain or reduce the Total Estimated Cost of the project; however, there is potential for cost growth at the Fernald Environmental Management Project (FEMP) because the baseline estimates do not include contingency, and Operable Unit 4 (Silos Project) is in the process of amending the Record of Decision with the EPAs.

Safety & Health Hazards:

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Project Description Narratives

The project confines and extracts the uranium contamination via a series of wells then transports the water to a centralized processing facility where contamination is removed and the water discharged to the Great Miami River. Portions of the project have been in operation since 1993. The AWWT facility operation is covered by an FSAR that states the facility is categorized as radiological because it exceeds the radiological limits of 40 CFR 301. The AWWT also stores greater than the RO per 40 CFR 302.4 of sodium hydroxide. Approximately 15,000 gallons of 20% sodium hydroxide solution is contained outside the facility in tank T-29. The specific hazards associated with the facility are documented in the Advanced Wastewater Treatment Facility Final Safety Analysis Report, FEMP-2397.

Safety & Health Work Performance:

The resources necessary to plan and provide oversight in order to accomplish the planned work safely are provided through the projects allocation of assigned safety and health functional area subject matter experts. Safety and health resources representing functional areas such as radiological safety, occupational safety and health, fire protection engineering and emergency management are planned and allocated into the projects by cost centers through the work breakdown structure. Safety and health funding for this project is expected to remain constant until final closure is accomplished. There are no unfunded Safety and Health categories.

PBS Comments:

The use and implementation of extraction and reinjection wells (Office of S&T) is needed to effect the restoration of the Aquifer.

The FEMP project has already undergone strategic planning to accelerate the cleanup from 25 years to 10 years, on the assumption that reinjection will prove successful. This has resulted in a significant amount of savings. To further reduce mortgage costs and allocate additional funds to the cleanup activities requires: a) the removal of the nuclear materials from the site; b) completion of safe shutdown activities; c) utility reduction projects, and (d) innovative technology particularly for real-time analysis, certification of cleanup/release levels. A factor that allowed the FEMP to pursue accelerated cleanup is the agreement and recommendations made by the Citizens Task Force on cleanup levels and disposition of the waste (amount and waste acceptance criteria levels for onsite disposal facility and disposition off-site for wastes above the waste acceptance criteria). Efforts at recycling materials from the site have been initiated to help reduce/minimize the size of the disposal cell.

Fernald developed and implemented an accelerated schedule in FY 1995. This baseline was validated and granted Level 1 approval on August 21, 1996. Impacts to the baseline due to the current funding targets will cause a three year schedule extension. Fernald has committed to implementing cost savings, productivity improvements, and incremental funding to complete the project within the FY 2006 timeframe.

Baseline Validation Narrative:

On October 29, 1998, DOE-FEMP received DOE-HQ approval on the Fiscal Year 1999 Replan Baseline Change Proposal to the current FEMP Baseline. The FEMP Baseline had been previously validated after DOE-HQ completed their review and provided their approval on August 21, 1996. Many internal and external reviews have been performed on the FEMP Baseline. In March 1998, the U.S. Corps of Engineers performed an external cost review on the OSDF project with results showing the disposal cell estimates consistent with industry standards. In August 1997 and January 1996, external cost reviews were performed on Operable Unit 4, one by the U.S. Corps of Engineers and one by the U.S. Department of Interior (DOI) and the U.S. Department of Energy (DOE). In June 1996, LMI, Janson Associates, and Burns & Roe performed an external cost review on support costs showing the cost estimates were reasonable. In July 1995, DOI and DOE performed an external cost review on Operable Unit 1 and made formal

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Project Description Narratives

recommendations to generate technical and/or economic advantages. In September 1993, MTC, Booz-Allen, and Burns & Roe performed an external cost review on the FEMP site and had no significant findings. In addition to external cost reviews, since 1991 almost fifteen internal reviews have been performed.

General PBS Information

Project Validated? Yes **Date Validated:** 10/29/1998

Has Headquarters reviewed and approved project? Yes

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/8/1999

FEDPLAN Project? Yes

Drivers:	**CERCLA**	**RCRA**	**DNFSB**	**AEA**	**UMTRCA**	**State**	**DOE Orders**	**Other**
	Y	Y	N	N	N	N	N	Y

Project Identification Information

DOE Project Manager: Rob Janke

DOE Project Manager Phone Number: 513-648-3124

DOE Project Manager Fax Number: 513-648-3076

DOE Project Manager e-mail address: rob.janke@fernald.gov

Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	**2007-2070 Total**	**1997-2070 Total**	**1997**	**Actual 1997**	**1998**	**Actual 1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
PBS Baseline (current year dollars)	245,827	28,696	274,523	32,466	23,864	24,629	30,043	23,202	25,617	23,154	21,171	25,228	21,114	29,183	20,063

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Project **OH-FN-04 / Aquifer Restoration**

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (constant 1999 dollars)	229,420	22,880	252,300	32,466	23,864	24,629	30,043	23,202	24,944	21,953	19,545	22,678	18,481	24,872	16,650
PBS EM Baseline (current year dollars)	245,827	28,696	274,523	32,466	23,864	24,629	30,043	23,202	25,617	23,154	21,171	25,228	21,114	29,183	20,063
PBS EM Baseline (constant 1999 dollars)	229,420	22,880	252,300	32,466	23,864	24,629	30,043	23,202	24,944	21,953	19,545	22,678	18,481	24,872	16,650

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	14,177	14,519	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	11,456	11,424	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	14,177	14,519	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	11,456	11,424	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.10%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070

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2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/1/2008

Current Projected End Date of Project: 9/30/2008

Explanation of Project Completion Date Difference (if applicable):

The previous project completion date from last year's PBS simply states September 2008. When the data was seeded, the system assumed September 1, 2008. However, the baseline project completion date remains September 30, 2008.

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	243,186	**Actual 1997 Cost:**	23,864	**Actual 1998 Cost:**	30,043
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	189,279	**Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):**			5,111
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	194,390				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):	4,988	$4,988K due to higher labor cost projections.
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	199,378	
Additional Amount to Reconcile (+):	-4,173	($3,513K) due to FY97/FY98 Uncosted Balances. ($662K) due to escalation error.

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Project **OH-FN-04 / Aquifer Restoration**

Project Reconciliation

Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): **195,205**

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Initiate activities for aquifer restoration.			10/1/1992								
Complete pump and treat activities for aquifer restoration.			9/30/2008								
Submit Preliminary Waste Storage Area Extraction Design Package to EPAs.	5ABPC1M001		6/15/2001	6/15/2001			Y				
Submit Preliminary Plant 6 Area Extraction Design Package to EPAs.	5ABPD1M001		8/15/2001	8/15/2001			Y				
Submit Pre-Final Plant 6 Area Extraction Design Package (Task 6).	5ABPD1M002		11/30/2001	11/30/2001			Y				
Submit Pre-Final Waste Storage Area Extraction Design Package (Task 7) to EPAs.	5ABCD1M002		11/30/2001	11/30/2001			Y				
Submit Sitewide Residual Remedial Action Work Plan to USEPA.			5/28/2002	5/28/2002			Y				
Submit Draft Final Sitewide Residual Remedial Action Work Plan to USEPA.			8/2/2002	8/2/2002			Y				
Commence operations for Plant 6 Area Extraction System.			10/1/2003	10/1/2003			Y				
Commence operations for South Field Extraction System, Phase II.			10/1/2003	10/1/2003			Y				
Commence operations for South Field Injection System.			10/1/2003	10/1/2003			Y				
Commence operations for Waste Pit Area Extraction System.			10/1/2003	10/1/2003			Y				

Milestones - Part II

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Project **OH-FN-04 / Aquifer Restoration**

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Initiate activities for aquifer restoration.				Y							
Complete pump and treat activities for aquifer restoration.					Y	Y					
Submit Preliminary Waste Storage Area Extraction Design Package to EPAs.	5ABPC1M001										Submit Preliminary Waste Storage Area Extraction Design Package (Task 7) to EPAs.
Submit Preliminary Plant 6 Area Extraction Design Package to EPAs.	5ABPD1M001										Submit Preliminary Plant 6 Area Extraction Design Package to EPAs (Task 6)
Submit Pre-Final Plant 6 Area Extraction Design Package (Task 6).	5ABPD1M002										
Submit Pre-Final Waste Storage Area Extraction Design Package (Task 7) to EPAs.	5ABCD1M002										Addenda to the Remedial Action Work Plan will be furnished to convey module-specific enforceable RA construction schedules.
Submit Sitewide Residual Remedial Action Work Plan to USEPA.											
Submit Draft Final Sitewide Residual Remedial Action Work Plan to USEPA.											
Commence operations for Plant 6 Area Extraction System.											Only Table 2-1 "commence operations" milestones are legally enforcealbe per RTC, April 1997.
Commence operations for South Field Extraction System, Phase II.											Only Table 2-1 "commence operations" milestones ae legally enforceable, per RTC, April 1997.
Commence operations for South Field Injection System.											Only Table 2-1 "commence operations" milestones ae legally enforceable, per RTC, April 1997.

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Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Commence operations for Waste Pit Area Extraction System.											Only Table 2-1 "commence operations" milestones ae legally enforceable, per RTC, April 1997.

Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planne 200
RS														
Assess.	NR	0.00	0.00	0.00	2.00									
RS														
Cleanup	NR	0.00	2.00	2.00										
LLW														
Storage	M3							640.00	640.00	640.00	640.00	640.00	640.00	640.0
LLW														
Ship to DOE Disp.	M3	5,680.00	1,280.00	6,960.00	0.00		0.00	560.00	640.00	640.00	640.00	640.00	640.00	640.0
Rem. Waste														
Disposed	M3	0.00	0.00	0.00	0.00		0.00							
Tech.														
Deployed	Ntd	1.00	0.00	1.00					1.00					

Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
RS													
Assess.	NR												

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Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
RS													
Cleanup	NR					2.00							
LLW													
Storage	M3	640.00	640.00	640.00	640.00	640.00							
LLW													
Ship to DOE Disp.	M3	640.00	640.00	640.00	640.00	640.00							
Rem. Waste													
Disposed	M3												
Tech.													
Deployed	Ntd												

Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total
RS										
Assess.	NR									2.00
RS										
Cleanup	NR									2.00
LLW										
Storage	M3									
LLW										
Ship to DOE Disp.	M3									5,760.00
Rem. Waste										
Disposed	M3									0.00
Tech.										
Deployed	Ntd								1.00	1.00

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Release Sites

Site Code	RSF ID	Change Flag	Description	Class/Subclass Name	Planned Assess. Year	Forecast Assess. Year	Actual Assess. Date	Planned Comp. Year	Forecast Comp. Year	Actual Comp. Date	Acc. Year	No Action	Comp. Status	RAD
FEMP	0229		51 \ Aquifer Restoration	Above Ground Material / Waste/Storage Yards and Pads	1996	1996	12/6/1995	2008	2005			N		N
FEMP	0247		51A \ South Plume	Above Ground Material / Waste/Debris Piles	1996	1996	12/6/1995	2008	2005			N		N

Technology Needs

Site Need Code: OH-F001

Site Need Name: Use of Groundwater Re-Injection at the FEMP as an Enhancement to Aquifer Remediation

Focus Area Work Package ID: SS-08 **Focus Area Work Package:** Saturated Zone Treatment Systems

Focus Area: SCFA **Agree with Technology Link:** Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate
Solution Mining	45,000	Medium

Related CCP Milestones	Related Waste Streams	Agree?	Change?
	00075: LLW-15 - LLW-Contaminated Wastewaters	Y	N

Site Need Code: OH-F035

Site Need Name: Enhanced Sensitivity Radon Meter

Focus Area Work Package ID: MW-08 **Focus Area Work Package:** Facilitating Deployment for Unique Wastes

Focus Area: MWFA **Agree with Technology Link:** N

Benefits (Cost, Risk Reduction, Both): Cost

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

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Technology Needs

Site Need Code: OH-F034

Site Need Name: Improved High Volume Air Sampler Capable of Fractionation of Airborne Particles

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

Technology Deployments

	Deployment Year		
Deployment Status	**Planned**	**Forecast**	**Actual Date**
Technology Name: Solution Mining			
Potential Deployment	1999	1999	